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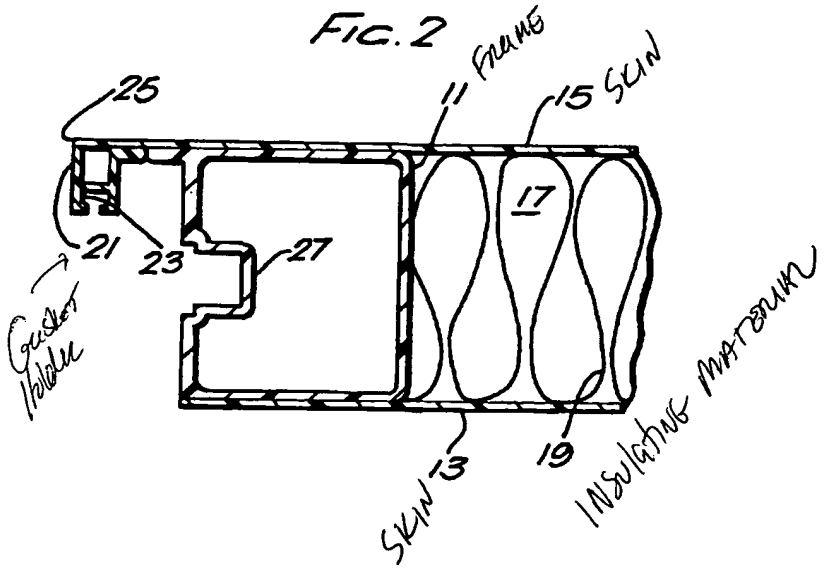
(54) Abstract Title
A door with a separate gasket holder

(57) A door comprising a support frame fabricated from elongate lengths 11, face panels 13,15 attached to the support frame and a gasket holder 21 separate from the support frame attached adjacent to a free edge 25 of a face panel 15. By separating the gasket holder 21 from the elongate length 11 of the support frame, the gasket holder 21 can be manufactured in a variety of different colours to match up with the colours of the face panels 15. Further, by separating the gasket holder 21 from the elongate lengths 11 of the support frame, the elongate lengths 11 can be manufactured from pultruded material such as glass reinforced polyester (GRP). Since GRP has a significantly greater stiffness than UPVC, additional metal reinforcement within the GRP pultruded elongate lengths 11 becomes unnecessary. The gasket can be co-extruded with the gasket holder 21.

FIG. 2



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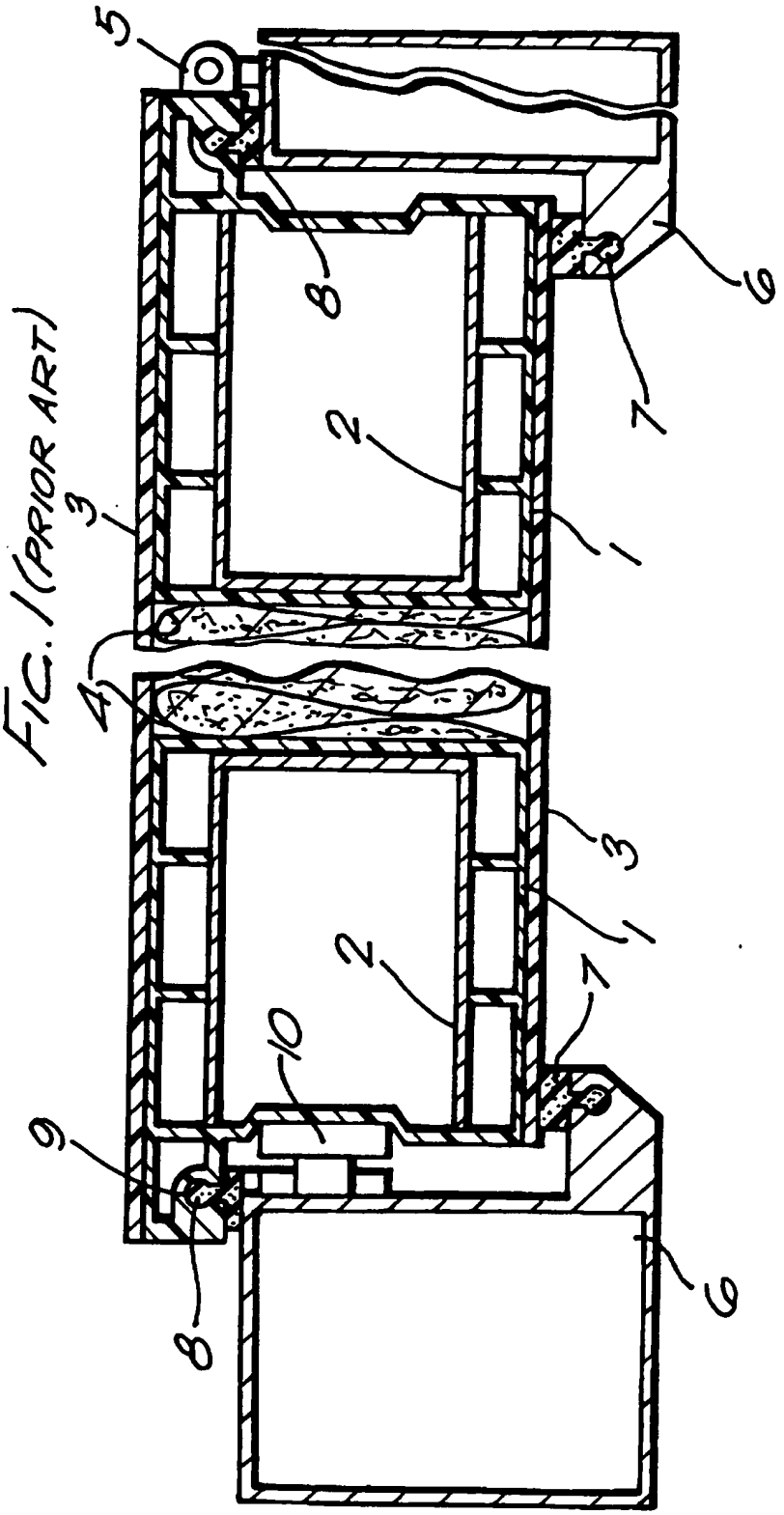
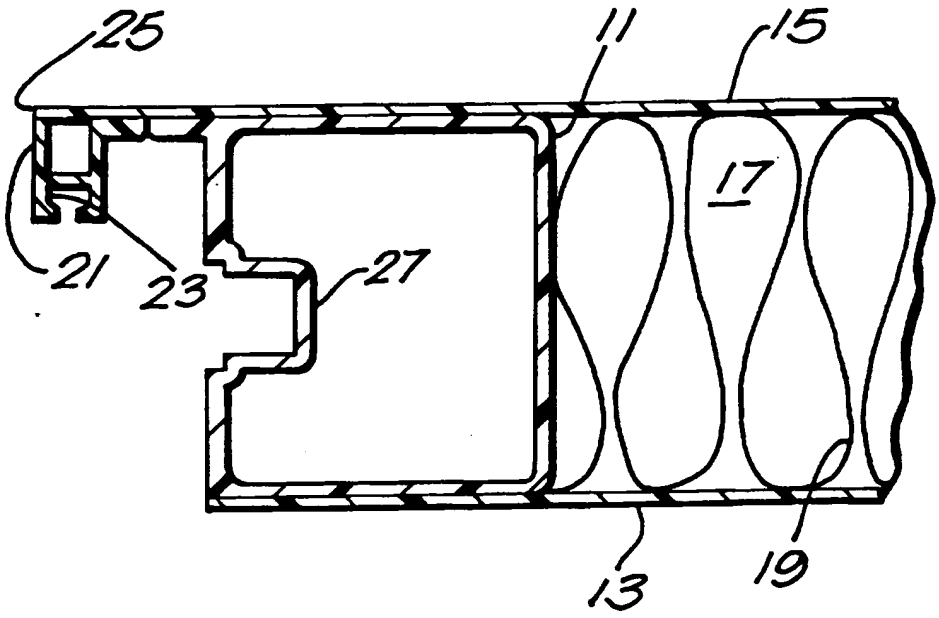


FIG. 1 (PRIOR ART)

FIG. 2



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A DOOR

The present invention relates to doors.

U.K. patent 2183706, filed 7th December, 1985, discusses prior art wooden doors and UPVC doors, and discloses a novel composite door comprising a frame-work fabricated from material extruded as elongate lengths of regular cross-section and composition and one-piece side panels bonded to the frame-work to cover the full lateral extent of the frame-work and to leave exposed the edges of the frame-work defining the edges of the door. The frame-work of the door is disclosed as being extruded UPVC material, which is normally reinforced with steel work, or extruded aluminium which does not require reinforcement. A door and frame, similar to that disclosed in U.K. patent 2183706, is shown in Figure 1 herein.

With reference to Figure 1, the door comprises a rectangular frame-work of extruded UPVC sections 1 reinforced with steel sections 2. Molded panels 3 are bonded to the frame-work 1 and a cavity between the panels 3 and the frame-work 1 is filled with a foam plastics material 4. The door is attached by a hinge 5 to a fixed frame 6 and gaskets 7 mounted in a rebate of the frame 6 abut the door to provide a weather seal. Additional gasket seals 8 are received in gasket grooves 9 formed in the extruded UPVC sections and abut the fixed frame 6 when the door is closed. A mortise lock 10 acts between the door and the fixed frame 6.

As can be seen from Figure 1, the extruded UPVC section 1 defining the gasket groove 9 is visible adjacent an edge of the door panel 3 even when the door is closed. Since the mass produced UPVC extrusions will preferably all be the same colour, when a door panel 3 having a different colour is applied an unsightly appearance can result at this exposed edge of the door. To overcome this problem, as suggested in U.K. patent 2183706, this edge can be concealed

by flow coating or painting the edge of the door. Neither of these possibilities is ideal.

In the light of the foregoing, the present invention aims to improve over the well known prior art doors of the general type disclosed in U.K. patent 2183706 by manufacturing doors in a manner which, at first sight, appears to be less efficient, but actually results in a marked improvement over the known doors.

According to the present invention, there is provided a door of the general type disclosed in U.K. patent 2183706 comprising a support frame fabricated from elongate lengths, face panels attached to the support frame and a gasket holder separate from the support frame attached adjacent to a free edge of a face panel. By separating the gasket holder from the support frame, it is necessary to manufacture a separate component. However, this separate component can be manufactured in any number of different colours to match the face panel to be used on the door. Hence, an unsightly door edge can be avoided because the gasket holder colour can be matched to the door panel colour. Indeed, a door according to the present invention preferably has a gasket holder which has substantially the same colour as its adjacent face panel.

The gasket holder is preferably formed from plastics material, more preferably as a thermoplastic extrusion.

The gasket holder may be co-extruded with a gasket of softer material.

Another advantage which arises from producing a separate gasket holder is that a number of different sized gasket holders can be manufactured. This allows a multitude of door frames having different shapes and sizes to be catered for without the need to produce complete support frames incorporating different sized gasket holders.

Although it is relatively easy to produce an extruded plastics gasket holder having a defined recess for receiving a gasket, if the gasket holder is produced by pultrusion, it is likely to be necessary to machine the resulting profile to produce a satisfactory shape. Because of this, the prior art technique for manufacturing the elongate lengths of the frame-work has been to use extrusion. If, however, pultrusion is used, which can be the case for elongate lengths which do not involve intricate shaping as needed for a gasket holder, materials such as glass reinforced polyester (GRP) can be used. This is beneficial because GRP has a significantly higher stiffness than UPVC and can act as a support frame without the need for any steel reinforcement. Clearly this results in a significant saving in both materials and manufacturing time.

In the light of the foregoing, the present invention also provides a door comprising a support frame and face panels attached to the support frame, wherein the support frame is fabricated from elongate lengths of pultruded material. The pultruded material may be glass reinforced polyester (GRP), but any other appropriate pultrudable material may be used.

As indicated above, the use of pultrusion only became a commercial option when the invention idea of separating the gasket holder from the support frame was made. As will be appreciated, however, both aspects of the invention result in significant improvements and advantages.

Preferably the face panels are fabricated from glass reinforced polyester. Other appropriate materials can, of course, alternatively be used. The face panels may be attached to the support frame by epoxy resin adhesive, chemical welding or any other appropriate means.

Each face of the door is preferably formed by a single face panel. Unsightly joins should be avoided.

If appropriate, the face panels may be shaped or contoured.

Although preferably not necessary, the support frame may include metal reinforcement in certain circumstances. This reinforcement may be steel, but other appropriate reinforcing materials can, of course, be used without departing from the scope of the present invention. Preferably the elongate lengths have a constant cross-section throughout the framework. If necessary, however, lengths having different cross-sections may be used for different parts of the support frame. In any event, the elongate lengths preferably have a cross-section which is substantially rectangular. This makes for easy pultrusion.

The support frame and the face panels preferably define a cavity filled with insulating material.

A specific embodiment of the present invention is now described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 is a schematic section through a prior art door and frame as disclosed in U.K. patent 2183706; and

Figure 2 is a cross-section through part of a door according to the present invention.

With reference to Figure 2 of the drawings, a door according to the present invention comprises a plurality of elongate lengths 11 defining a substantially rectangular frame for supporting front and rear face panels 13,15. The elongate lengths 11, which are joined together at right angles using known techniques such as 90° sections, are formed by pultruding glass reinforced polyester. The face panels 13,15, which are vacuum formed or pressed into shape, and are also made of glass reinforced polyester, are attached to the support frame using epoxy resin adhesive or chemical welding, for example. A cavity 17 formed between the face panels 13 and the elongate lengths 11 is filled with insulating material 19.

As can be seen in Figure 2, the rear face panel 15 extends past the support frame and carries a gasket holder 21 defining a recess 23 for receiving a gasket (not shown). The gasket holder 21 is formed from extruded plastics material, such as UPVC. As a result, elongate lengths of the extruded UPVC can be manufactured in a plurality of different colours in line with the colours chosen for the rear face panel 15. The amount of space needed to store these elongate lengths of extruded UPVC is considerably less than would be required to store corresponding amounts of differently coloured complete support frames.

The gasket holder 21 is secured to the face panel 15 adjacent its edge 25 using epoxy resin adhesive, chemical bonding, or any other appropriate means. If the colours of the face panel 15 and the gasket holder 21 are essentially the same, the join between the two will be indiscernible.

By manufacturing the support frame from the elongate lengths 11 of pultruded glass reinforced polyester, the strength of the support frame will be sufficient in normal circumstances for the use of metal reinforcement to be unnecessary. Hence, savings can be made in the materials needed to produce a door according to the present invention and, indeed, the time taken to manufacture the doors can be reduced.

Although not shown in Figure 2, a mortise lock or other locking device may be accommodated in a channel 27 formed in the elongate lengths 11. Further, although the face panels 13,15 shown in Figure 2 are essentially plain, they can be shaped or contoured in any desired manner provided that they can be readily attached to the fixed frame in a satisfactory manner.

Further, the elongate lengths 11 preferably have a substantially rectangular cross-section which is constant throughout the support frame. In theory, however, lengths having different cross-sections may be used for different parts of the support frame, if appropriate.

It will of course be understood that the present invention has been described above purely by way of example, and that modifications of detail can be made within the scope of the invention.

CLAIMS

1. A door comprising a support frame fabricated from elongate lengths, face panels attached to the support frame and a gasket holder separate from the support frame attached adjacent to a free edge of a face panel.

2. A door as claimed in claim 1, wherein the gasket holder and the face panel are substantially the same colour.

3. A door as claimed in claim 1 or claim 2, wherein the gasket holder is formed from plastics material.

4. A door as claimed in claim 3, wherein a gasket holder is a thermoplastic extrusion.

5. A door as claimed in any preceding claim, wherein a gasket is co-extruded with the gasket holder.

6. A door comprising a support frame and face panels attached to the support frame, wherein the support frame is fabricated from elongate lengths of pultruded material.

7. A door as claimed in claim 6, wherein the pultrusion material is glass reinforced polyester (GRP).

8. A door as claimed in claim 6 or claim 7 and as claimed in any one of claims 1-4.

9. A door as claimed in any preceding claim, wherein the face panels are fabricated from glass reinforced polyester.

10. A door as claimed in any preceding claim, wherein the face panels are attached to the support frame by epoxy resin adhesive or chemical welding.

11. A door as claimed in any preceding claim, wherein each face of the door is formed by a single face panel.

12. A door as claimed in any preceding claim, wherein the face panels are contoured.

13. A door as claimed in any preceding claim, wherein the support frame includes metal reinforcement.

14. A door as claimed in any preceding claim, wherein the elongate lengths have a constant cross-section.

15. A door as claimed in claim 13, wherein the cross-section is substantially rectangular.

16. A door as claimed in any preceding claim, wherein the support frame and the face panels define a cavity filled with insulating material.

17. A door substantially as hereinbefore described with reference to and as shown in Figure 2 of the accompanying drawings.

18. A door as claimed in any preceding claim in combination with a fixed frame and a plurality of gaskets for acting between the door and the fixed frame.

The Patent Office

Application No:	GB 9804393.8	**Examiner:**	Andrew Jenner
Claims searched:	1 - 5, 8 - 18	**Date of search:**	18 December 1998

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.P): E1J: JGD, JGE, JGS

Int Cl (Ed.6): E06B: 3/00, 3/04, 3/26, 3/70, 3/72, 3/74, 3/76, 3/78

Other: Online: World Patents Index

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
A	GB 2315292 A	CARADON EVEREST LTD. - see figures	
A	EP 0803633 A1	GAUL - see figure 2	
A	EP 0476978 A1	DURAFLEX LTD.- see figure 1	
A	EP 0156108 A2	BLAU	
X	DE 3143144 A	ZIEGER - see figure 3	1 - 4, 13 - 15

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.